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The impacts of port infrastructure and logistics performance on economic growth: the mediating role of seaborne trade

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Steps in examination of mediation effect in Structural Equation Models

Step 1: Does the initial variable affect the outcome?

Step 2: Does the initial variable affect the mediator?

Step 3: Does the mediator affect the outcome variable?

Step 4: To establish that the mediator mediates the initial-outcome variable relationship, the effect of initial variable on outcome controlling for mediator should be lower than in Step 1

- *H1 (d): The quality of port infrastructure has a positive effect on national economy mediated through logistics performance.*

Steps	Relationship	Std. Estimate	S.E.	C.R.
Step 1	QPI → NE	0.58***	0.25	8.87
Step 2	QPI → LP	0.67***	0.04	13.33
Step 3	LP → NE	0.73***	0.29	14.95
Step 4	Please see Table 4			

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Std. Estimate = standardized estimates, S.E. = standard error, C.R. = critical ratio

- *For H1 (e): Quality of port infrastructure (QPI) has a positive effect on national economy (NE) mediated through seaborne trade (ST).*

Steps	Relationship	Std. Estimate	S.E.	C.R.
Step 1	QPI → NE	0.58***	0.25	8.87
Step 2	QPI → ST	0.36***	0.38	5.34
Step 3	ST → NE	0.37***	0.06	4.51
Step 4	Please see Table 4			

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Std. Estimate = standardized estimates, S.E. = standard error, C.R. = critical ratio

- *For H1 (e): Quality of port infrastructure has a positive effect on national economy mediated through logistics performance and seaborne trade.*

Steps	Relationship	Std. Estimate	S.E.	C.R.
Step 1	QPI → NE	0.58***	0.25	8.87
Step 2 (a)	QPI → LP	0.67***	0.04	13.33
Step 2 (b)	QPI → ST	0.36***	0.38	5.34
Step 3 (a)	LP → ST	0.60***	0.49	10.64
Step 3 (b)	LP → NE	0.73***	0.29	14.95
Step 3 (c)	ST → NE	0.37***	0.06	4.51
Step 4	Please see Table 4			

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Std. Estimate = standardized estimates, S.E. = standard error, C.R. = critical ratio

- *For H2 (c): Logistics performance has a positive effect on national economy mediated through seaborne trade.*

Steps	Relationship	Std. Estimate	S.E.	C.R.
Step 1	LP → NE	0.73***	0.29	14.95
Step 2	LP → ST	0.60***	0.49	10.64
Step 3	ST → NE	0.37***	0.06	4.51
Step 4	Please see Table 4			

p<0.05, **p<0.01, *p<0.001*

Std. Estimate =standardized estimates, S.E. = standard error, C.R. = critical ratio